Minnesota

Public Works

Communications Best Practice Guide

Statewide Radio Board, Operations & Technical Committee, Interoperability Committee, Public Works Best Practice Workgroup

Approved by the Statewide Emergency Communications Board

September 22, 2016

This document describes the recommended best practice, standards, and contact information for Minnesota public works to assist in planning for interoperability with other public safety disciplines.

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DOCUMENT REVISION HISTORY

Date	Revision	Notes	Name
5-17-2013	Removed Tom Johnson Added NWS standard info	Replaced with Brandon Abley	Cathy Anderson
4-29-2016	Entire guide		Workgroup

Section I: Introduction

The Public Works Best Practice Workgroup was created in 2012 to develop a Best Practice Guide for public works disciplines within the various agencies that are on the ARMER radio system or are in the process of migrating to the ARMER radio system. This guide is designed to serve as both a training plan and a resource document, providing a basic outline for the development of talkgroup layouts, and SOPs when interoperating with other disciplines of the same agency or other governmental and nongovernmental agencies. As the migration to ARMER continues to develop throughout the state, it is important for participating agencies to adopt similar programming and operational methods to facilitate seamless interdisciplinary and interagency communication. We will address communication between:

- Public works to public works
- Public works to law enforcement
- Public works to fire units
- Public works to EMS
- Public works to nearest dispatch center

It is likely that most public works disciplines migrating to the ARMER system have their law enforcement and fire departments already operating on the system or making the migration jointly, resulting in much of the fleetmap already being in place. Therefore, the affected public works disciplines will need to add talkgroups necessary for their operations, as well as talkgroups that would be necessary for operations with agencies or other disciplines they may work with on a regular basis.

It is important to remember that the most effective level of interoperability is achieved when users share the same radio system and have shared talkgroups directly accessible to them in their radios. Realizing the difficulty in achieving this goal statewide, this guide will set forth best practices for using current systems for the optimal interoperability solutions to address daily operations and extraordinary occurrences. The Minnesota Public Works Communications Best Practice Guide is a living document, and suggested changes may be submitted to the Emergency Communication Networks (ECN) Standards & Training Coordinator.

NOTE: Questions regarding State Standards or clarification of these standards should be directed to your Local System Administrator, Your Regional Interoperability Coordinator (RIC), or the Statewide Interoperability Program Manager.

Section II: ARMER Basics for Public Works

Each agency should customize their training plan to fit their own unique situation.
It is recommended that all training be completed by a qualified ARMER trainer.

State Standard 1.11.4, Training 800 MHz Users

This standard establishes the minimum training standards for radio operators to ensure proper operation of radios on the system.

Suggested supplemental training beyond the required training listed in State Standard 1.11.4:

It is highly recommended that Public Works personnel view training modules, created on behalf of the Statewide Emergency Communications Board (SECB) and reviewed and approved by subject matter

experts. These training modules are hosted through the Alexandria Technical & Community College online website. They can be accessed from ECN's website at dps.mn.gov/divisions/ecn, then ARMER and ARMER Standards.

A user name and password will be needed for these training modules, and instructions for obtaining these are posted on ECN's website under ARMER Standards. While web-based training is supplemental, except for the Minimum Training Requirements, all users must attend formal training for the ARMER system.

Alexandria Technical & Community College Training Modules

- Radio 101
- History of ARMER
- Interoperability 101
- Interoperability: How to Communicate Outside Your Agency
- Other relevant modules as developed

FEMA/NIMS Courses, NIMS training courses can be found at:
https://training.fema.gov/is/crslist.aspx?all=true

- IS-100PWb, Introduction to the Incident Command System (ICS100) for Public Works
- IS-700a, National Incident Management System (NIMS), An Introduction

Attending Field User ARMER Training: Information on local Field User Training may be obtained through your Local System Administrator or Regional Advisory Committee (RAC).

Section III: Public Works Related Statewide Standards

State Standard 1.11.4, Training 800 MHz Users

This standard establishes the minimum training standards for radio operators to ensure proper operation of radios on the system

State Standard 2.6.0, Fleetmap Standards

A Fleetmap is a list of talkgroups or channels that are programmed into your radios. The Allied Radio Matrix for Emergency Response System (ARMER) will contain a large number of talkgroups and multigroups to support the various agencies that will be subscribing to the system.

The ARMER System has multiple administrating agencies that will be maintaining fleetmaps and system programming of agencies they are responsible for. For the effective management of the system, a defined process needs to be used to document the fleetmap information that each administrating agency is supporting. This information needs to be in a format that is shared with the other administrators.

This also provides a resource for the subscribing agencies to reference when planning interagency communications. System fleetmaps contain configuration information that is classified as "Security Information" and "General Non-Public Data," pursuant to Minn. Stats. § 13.37, Subd. 1a.

State Standard 2.8.0, Talkgroup and Radio User Priority

This standard establishes varying priority levels for talkgroups to ensure the most critical talkgroups on the system are granted a channel as quickly as possible when and where the system is experiencing busy conditions.

State Standard 2.12.0, Scanning

This standard identifies operational procedures and responsible authorities governing scanning activities.

In many jurisdictions, public works users are issued radios with more limited features than those used by public safety users. As a result, it is sometimes difficult for public works users to manage lists of scanned talkgroups in their radios. Public works users with questions about scanning are encouraged to work with their local system administrator.

State Standard 3.15.0, Use of Scene of Action (SOA)

This standard provides standards, protocols, procedures, and operating parameters for Scene-of-Action channels.

The public safety discipline is best served by creating an operating procedure that maintains safety of personnel in situations. The range of mobiles and the "walk over" issue is a critical point. Once a radio is keyed, there is no way to control the footprint of the transmission, other than limiting the power of that transmission. Personnel talking on a mobile radio may have no way of knowing if they are walking over a portable in the next community, because they will not be able to receive it or realize that the channel is in use by the portable.

Public works users should be aware that by switching to an SOA channel, they are leaving the ARMER network and are operating in a direct, "radio-to-radio" mode. This has advantages in certain situations, such as highway flagging operations, where short distance communications are required with a limited number of users. Using SOA channels does not impose any system loading on the local ARMER network. Although mobile radios are permitted on SOA channels, portable radios are recommended in most cases, due to the limitations explained in the paragraph above.

Public works personnel should become familiar with the content of all state and Radio Region Standards included in the Best Practices Guide. While some contain more specific and pertinent information than others, all public works personnel, regardless of position, should have a good understanding of each standard. State and Regional Standards may be accessed through ECN's website under ARMER, then ARMER Standards.

Section IV: Interoperability

Regional Tactical Interoperable Communications Plan (TICP)

Tactical Interoperable Communications Plans are used by jurisdictions to document interoperable communications governance structures, technology resources, and usage policies/procedures. The TICP describes what interoperable communications assets are available in an area, how those assets are shared and prioritized, and the steps that individual agencies should use to request, activate, and deactivate them.

Public works personnel should be familiar with the regional communications resources that are available to their jurisdiction, as well as the process they must follow to request them. Copies of Regional TICP's are available through your Regional Advisory Committee (RAC).

State Standard 2.7.0, Use of Shared Talkgroups

This standard provides options to users of the Allied Radio Matrix for Emergency Response System (ARMER), which will allow talkgroup owners to predefine sharing authorizations for other agencies.

State Standard 3.16.0, 800 MHz Statewide STAC Interoperability Talkgroups

This standard establishes policy and procedures for use of uniform, statewide 800 MHz interoperability STAC talkgroups in all user radios.

3.32.0, Statewide Interoperable Plain Language Policy

The use of plain language (clear text) in emergency management and incident response is a matter of public safety, especially the safety of emergency management/response personnel and those affected by the incident. It is critical that all those involved with an incident know and utilize commonly established operational structures, terminology, policies, and procedures. This will facilitate the achievement of interoperability across agencies/organizations, jurisdictions, and disciplines, which is exactly what National Incident Management System (NIMS) and the Incident Command System (ICS) is seeking to achieve.

It is recommended that public works personnel be required to use clear speech for day-to-day activities. A limited list of permitted codes should be published for users and be strictly adhered to. This will make it easier to use clear speech only on major events, as well.

Use of Minnesota State Patrol Call Talkgroup

Minnesota State Patrol General Order 16-40-015, MSP Hailing talkgroup: MSP –CALL General Order, may be found on the ECN website under ARMER, Guide Books, then Best Practices.

Bordering States and Provinces Interoperability

Talkgroups may be patched by dispatchers to radio systems in other counties, states, or countries (Canada). If a public works user is working on a talkgroup patched to another system, it is important to use plain speech (no 10 codes) and identify yourself with agency name, followed by unit number. Example: "Hastings Public Works 303 to St. Croix County."

Statewide Interoperability Zone

ARMER Standard 3.16.6, 800 MHz Statewide Uniform Interoperability Radio Zones, establishes policy and procedures for the implementation of two 800 MHz uniform interoperability zones in all subscriber radios throughout the state. This policy will guarantee standardized Statewide and Nationwide interoperable communications capabilities for all service branches.

This uniformity will provide dispatch centers, Incident Commanders (ICs), and Communications Unit Leaders (COMLs) the ability to develop and adapt incident radio communications plans quickly and

effectively without having to rely on reprogramming radios, swapping radios, or establishing patches in the field.

Based upon Standard 3.16.6, all Public Works subscriber radios shall have these two statewide interoperability zones (unless a waiver or variance has been granted):

STATEWIDE INTEROP		
ZONE DISPLAY NAME	ROTARY CHANNEL SELECTOR	CHANNEL DISPLAY NAME
MN	1	STAC1
MN	2	STAC2
MN	3	STAC3
MN	4	STAC4
MN	5	STAC5
MN	6	STAC6
MN	7	STAC7
MN	8	STAC8
MN	9	STAC9
MN	10	STAC10
MN	11	STAC11
MN	12	STAC12
MN	13	STAC13E*
MN	14	STAC14E*
MN	15	
MN	16	

CONVENTIONAL INTEROP		
ZONE DISPLAY NAME	ROTARY CHANNEL SELECTOR	CHANNEL DISPLAY NAME
8C	1	8CALL90
8C	2	8TAC91
8C	3	8TAC92
8C	4	8TAC93
8C	5	8TAC94
8C	6	8CALL90D
8C	7	8TAC91D
8C	8	8TAC92D
8C	9	8TAC93D
8C	10	8TAC94D
8C	11	8SOA1
8C	12	8SOA2
8C	13	8SOA3
8C	14	8SOA4
8C	15	FSOA1*
8C	16	FSOA2*

*STAC13E and STAC14E: Required in all DES-equipped radios (or waiver). Must use Statewide Common DES Encryption Key.

*FSOA1 and FSOA2: Required in Fire and EMS only (or waiver). Not allowed in non-Fire and EMS radios.

Personnel should familiarize themselves with ARMER Standard 3.16.6; specifically, the areas of technical background, operational context, standardized policy, and standardized procedure. Your Local System Administrator should be contacted if you have any questions related to technical background and encryption.

Section IV. Standard Minnesota VHF Interoperability Resources*

CH #	Channel Name	Short Name[1]	Mobile TX	Mobile RX	TX/RX Mobile CTCSS[2]	TX/RX Base CTCSS[3]
1	VCALL10	VCAL10	155.7525	155.7525	156.7/CSQ	156.7/156.7
2	VTAC11	VTAC11	151.1375	151.1375	156.7/CSQ	156.7/156.7
3	VTAC12	VTAC12	154.4525	154.4525	156.7/CSQ	156.7/156.7
4	VTAC13	VTAC13	158.7375	158.7375	156.7/CSQ	156.7/156.7
5	VTAC14	VTAC14	159.4725	159.4725	156.7/CSQ	156.7/156.7
6	MNCOMM	MNCOMM	155.3700	155.3700	156.7/156.7	156.7/156.7
7	VFIRE23	VFIR23	154.2950	154.2950	156.7/156.7	156.7/156.7
8	MNFIRG2	MNFG2	154.0100	154.0100	156.7/156.7	156.7/156.7
9	MNFIRG3	MNFG3	153.8300	153.8300	156.7/156.7	156.7/156.7
10	DNRTAC1	DNRT1	151.4750	151.4750	156.7/156.7	N/A[4]
11	VLAW31	VLAW31	155.4750	155.4750	156.7/156.7	156.7/156.7
12	VMED28	VMED28	155.3400	155.3400	156.7/156.7	156.7/156.7
13	IR 2	IR 2	165.9625	170.4125	167.9/167.9	167.9/167.9
14	VTAC14R	TAC14R	154.6875	159.4725	156.7/156.7	156.7/156.7
15	NGRPTR*	NGRPTR	Rest.	Rest.	Rest.	Rest.
16	LE 2*	LE 2	162.2625	167.2500	$68F/$68F	$68F/$68F

Section V: Compliance & Conflict Resolution

The suggested method for reporting conflicts noticed by public works personnel is to document the conflict and forward it to your supervisor. The supervisor should attempt to obtain a resolution with the other entity involved. However, if a conflict is not able to be resolved at this level, the issue should be brought to the Local System Administrator.

Section VI: Refresher Training Plan

While it is the responsibility of each agency to establish their own refresher training, it is imperative to keep personnel up-to-date on the latest technological innovations, as well as applicable local, regional, and state guidelines/mandates.

It is a best practice recommendation that ARMER online equipment and console training modules be reviewed annually, at a minimum. In addition, the Minnesota Public Works Communications Best

[1] For use with limited character display radios
* Local option channel if not implemented with LOA or MOU for use of federal channels.
[2] CTCSS or NAC for subscriber radios. For VCALL10, VTAC11, VTAC12, VTAC13, and VTAC14, use receive CTCSS of 156.7 if needed to mitigate interference.
[3] CTCSS or NAC for fixed stations.
[4] There are no permanent, fixed stations on DNRTAC1.

Practice Guide should become part of every agency's new trainee curriculum, and it should also be reviewed periodically in training sessions for current employees.

Online training modules are available to all users. These courses, created on behalf of the Statewide Emergency Communications Board (SECB) and reviewed and approved by subject matter experts, are hosted through the Alexandria Technical & Community College online website. They can be accessed from ECN's website under ARMER Standards.

A user name and password will be needed for these training modules, and instructions for obtaining these are posted on ECN's website under ARMER standards.

Section VII: Other Best Practices Guides

EMS
Hospital
Emergency Management/Public Health
Dispatcher
Fire
Law Enforcement

These guides have been created as a result of diligent work by the groups involved. Members of the workgroup who contributed to the most recent update of this Guide: Rick Juth (Central MN RIC), Pat Wallace (Blue Earth County Communications Center Administrator), Randy Donahue (Southern MN RIC), Dean Wrobbel (Fire Chief, City of St. Cloud), Darrin Haeder (SR System Admin; SR RAC alternate/OTC), Rod Olson (Manager of Radio Communications Electronics, City of Minneapolis), Brandon Larson (IT, City of St. Cloud), Tom Zabinski (Maintenance Supervisor, St. Cloud Public Works), and Cathy Anderson (Standards & Training Coordinator, ECN). These guides provide guidance for their respective public safety disciplines and are available online. Access to completed Best Practice Guides is available on ECN's website under ARMER and Guide Books.

Section VIII: Minnesota Emergency Communication Networks Contacts

Current email contact information can be found on the ECN website under Contact and then Staff Contacts.

Section IX: Regional Radio and Advisory Committee Contacts

Contacts for the Regional Emergency Communications Boards/Emergency Services Boards (ECB/ESB) and Regional Advisory Committees (RAC) can be found on the ECN website under ARMER, then ARMER Standards. The information will be at the bottom of the page.

Section X: Radio Affiliated Acronyms

You can find a link to commonly used radio-affiliated acronyms on the ECN website.